FLIGHT
The AIRCRAFT ENGINEER & AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

No. 864. (No. 29, Vol. XVII.) JULY 16, 1925 [Weekly, Price 6d. Post free, 7d.

Flight

The Aircraft Engineer and Airships

Editorial Offices: 36, GREAT QUEEN STREET, KINGSWAY, W.C. 2.
Telegrams: Truditur, Westcent, London. Telephone: Gerrard 1828.

Annual Subscription Rates, Post Free:

United Kingdom .. 30*s.* 4*d.* Abroad .. .. 33*s.* 0*d.**

These rates are subject to any alteration found necessary under abnormal conditions and to increases in postage rates

* *Foreign subscriptions must be remitted in British currency*

CONTENTS

Editorial Comment	PAGE
Light 'Plane Competitions	447
Welded Steel Tube Construction	448
Dutch Aircraft Construction	449
Royal Aero Club Official Notices	453
Light 'Plane and Glider Notes	454
A Basis for Light 'Plane Competitions	455
German Aviation and Allied Restrictions	457
Aeronautics at Wembley	458
Royal Air Force	459
R.A.F. Intelligence	459
In Parliament	459
Institution of Aeronautical Engineers	460

DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list :—

1925

July 26–Aug. 9 Vauville Light 'Plane and Glider Meeting.
Aug. 1-3 .... Royal Aero Club Race Meeting at Lympne.
Sept. 19–28 F.I.A. Conference at Prague.
Oct. 8 .... Aero Golfing Soc. Autumn Meeting, Walton Heath.
Oct. 24–29 Schneider Cup Race, Baltimore, U.S.A.

1926

Aug. .... Light Aeroplane Competition.

EDITORIAL COMMENT.

ALTHOUGH it may seem an obvious fact, we are afraid it is not always realised that in the encouragement of the light 'plane movement, the greatest incentive is low cost. If one tries to analyse the position one finds that, after examining all the factors involved, the whole problem in the end boils down to that of cost. Technically it is possible to design some splendid aeroplanes which will have quite a reasonable performance with engines of relatively low power. This was amply demonstrated by the light 'planes which took part in last year's Lympne competition. Almost without exception these machines were excellent examples of the aircraft designer's art: the workmanship and finish were of an extremely high order, and from a technical point of view it was very difficult to find any fault with these little light 'planes, but, and this is the rub, we very much doubt whether any of the machines entered, with the possible exception of the Cranwell biplane, which was an amateur effort, and a very praiseworthy one indeed, had cost manufacturers very much less than £1,000. Actually we believe that there were several which had cost considerably more. Now it is, of course, perfectly obvious that machines which, even in fairly large batches, are going to cost some £800 or £900 are scarcely likely to become "motor-cycles" of the air. No matter how excellent a light 'plane may be, and no matter how perfect from an aerodynamic and structural point of view, if the price is prohibitive, no one will buy it.

Light 'Plane Competitions

If it is granted that the question of cost is of primary importance, and we fail to see how anyone can seriously challenge this contention, it might have been thought that those responsible for drawing up the rules for the next light 'plane competition would have kept the question of cost prominently in view. From the fact that the basis chosen for next year's competition is one of engine weight only, *i.e.*, the limiting of the

engine weight to 170 lbs., it seems, however, that the all-important question of cost is still not being considered, and we frankly fail to see how any competition on a basis just as bad as, if not worse than, the original one of limiting engine capacity, can be expected to do any good in producing the types of machines and engines that are really required.

Personally what we should like to see, although we realise that for various reasons it may not be possible, is a competition in which the only restriction, or, at any rate the main restriction, is one of cost. For instance, the fundamental condition for machines being permitted to take part in the competition might be one of limiting the cost to a certain specified figure, such as £600, for instance. Competitors who were willing to produce their machines for that price in batches of 25 or 50, might then be required to go through the competition and machine getting the highest number of marks would win first prize; that gaining the second highest number of marks second prize, and so on. In other words constructors would be limited to a certain cost and designers would then be turned loose to see what they could do in the way of performance for that particular price.

We realise that such a simple basis might in reality be very difficult, since it would be no easy matter to agree between the whole of the British aircraft industry, to a price to be fixed upon as the maximum permissible for light 'planes, and so we offer this week another suggestion which is fully dealt with in an article published elsewhere in this week's issue. Briefly this suggestion is that a condition for machines to be admitted to the competition should be that the total weight of the engine, plus the fuel and oil it consumes in four hours at full power, should be limited to 325 lbs. Any competition decided upon would give each competitor a certain number of marks, and this number should then be divided by the price at which the competitor declared himself prepared to supply the machines in batches of 25 or 50.

The article in question assumes, for the purpose of argument, that the performances are the same as those for last year's competition, *i.e.*, marks being awarded for speed-range, get-off and pull-up. It is not suggested that this basis for awarding marks should necessarily be adopted again next year, but by assuming that it is adopted a basis for discussion is provided. It is found that although the limitations of price and performance do seem to tend to encourage the average sort of machine rather than the ultra-refined one, and thus to keep down the cost, somewhat, this formula still does not, perhaps, sufficiently encourage the cheap machine, and it is therefore suggested that it might possibly be better to divide by the square of the price instead of by the price. This would, of course, have the effect of heavily penalising the expensive machine and greatly encouraging the cheap one.

We do not regard this suggestion as the only basis that could be chosen, and put it forward rather with the idea of providing a basis from which to start a discussion of the whole question. At any rate we do think that the limitation of engine weight only will not produce the kind of machine that is wanted, and if anyone can offer a better scheme than our own, or one more simple in operation than the one we have outlined, we shall be very pleased to publish such suggestion in FLIGHT. Also criticisms of our scheme will be welcomed, since as we have already said, we do not regard this as being perfect by a very long way.

* * *

Welded Steel Tube Construction

Reference has been made in FLIGHT from time to time to the Fokker method of welded steel tube fuselage construction, and the view has been expressed that although, theoretically, open to objection, this form of construction has been found perfectly satisfactory in practice. Some little time ago representatives of FLIGHT had an opportunity of visiting the Fokker works at Amsterdam, where they observed the methods employed in the Fokker factory and saw welded joint tests in the laboratory. An article recording their impressions is given elsewhere in this issue of FLIGHT, which brings to light certain interesting points in connection with this form of construction. The objection usually raised against welded joints in aircraft construction is that, although a good weld is perfectly sound, there is no means of ascertaining definitely whether or not a given welded joint is properly made. The experience of the Fokker firm in this respect does not bear out that contention, and it has been found that if a welded joint is badly made the fact that it is defective can in practically all cases be ascertained from an inspection of the joint.

Curiously enough, although it is probably not generally known, a well-known British aircraft constructor has been experimenting for some months past with a form of construction somewhat similar to the Fokker, but avoiding the use of welded joints working in tension. Before this constructor decided to build a fuselage, he had numerous test specimens welded, which were afterwards tested to destruction, and his experience is almost identical with that of the Fokker works. In other words, whenever a welded joint failed in the testing machine, the fact that it would fail could have been predicted by previous examination of the joint. Also on the point of the degree of skill required, the British constructor's experience tallies with that of the Fokker works, *i.e.*, that either a man very soon becomes a good welder, or else he will never be skilled at the job, no matter how long he sticks at it.

In view of such evidence, does it not seem reasonable to demand that the Air Ministry should alter its present attitude towards welded joints, or at least modify its views to the extent of letting British constructors see what they can do? There can, we think, be no gainsaying the fact that welded steel tube construction is one of the cheapest ever devised, and although we do not suggest that British constructors should copy the Fokker method, we do think they should be given permission by the Air Ministry to experiment on somewhat similar lines in order, if possible, to evolve methods which will not only bring down the cost of aircraft construction, but would also reduce the time taken in constructing a machine. Both are points of the very greatest importance not only in commercial aviation, but equally in the production of machines for service purposes.

* * * *

August Race Meeting, Lympne. Closing Date for Entries

WE would draw our readers' attention to the fact that entries for the R.Ae.C. August Race Meeting at Lympne (August 1-3) close on Friday, July 24.

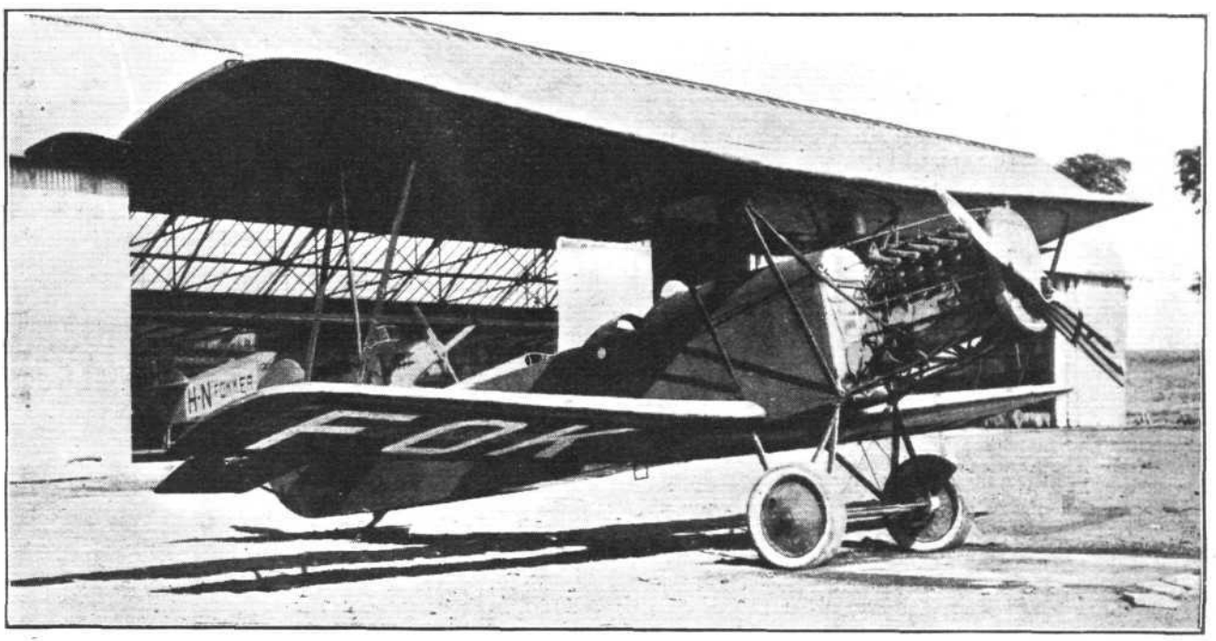
FLIGHT

DUTCH AIRCRAFT CONSTRUCTION

Some Impressions of a Visit to the Fokker Works at Amsterdam

No matter how much one sees of machines at aerodromes and in the air, one never obtains a really intimate conception of their manufacture and construction until one has seen the same machines going through the works. This fact was strongly borne in upon us some time ago, when an opportunity offered of paying a visit to the famous Fokker works in Amsterdam. The great Dutch designer himself was not, unfortunately, at home, being at the time absent on a visit to the United States. We had, however, a very excellent guide in Mr. B. Stephan, who is General Manager of the Fokker factories in Holland, and who speaks English so perfectly, that one is apt to forget, when going through the Fokker works in his company, that one is not in a British aircraft factory.

The present Fokker works, as some of our readers may be aware, are formed partly by two large buildings erected to house the machines exhibited at the Elta Show in 1919, and when these buildings were erected they were scarcely intended as permanent structures. For the time being, however, they have proved very convenient for the Fokker works, or to give them their proper title, the *N.V. Nederlandsche Vliegtuigen-*

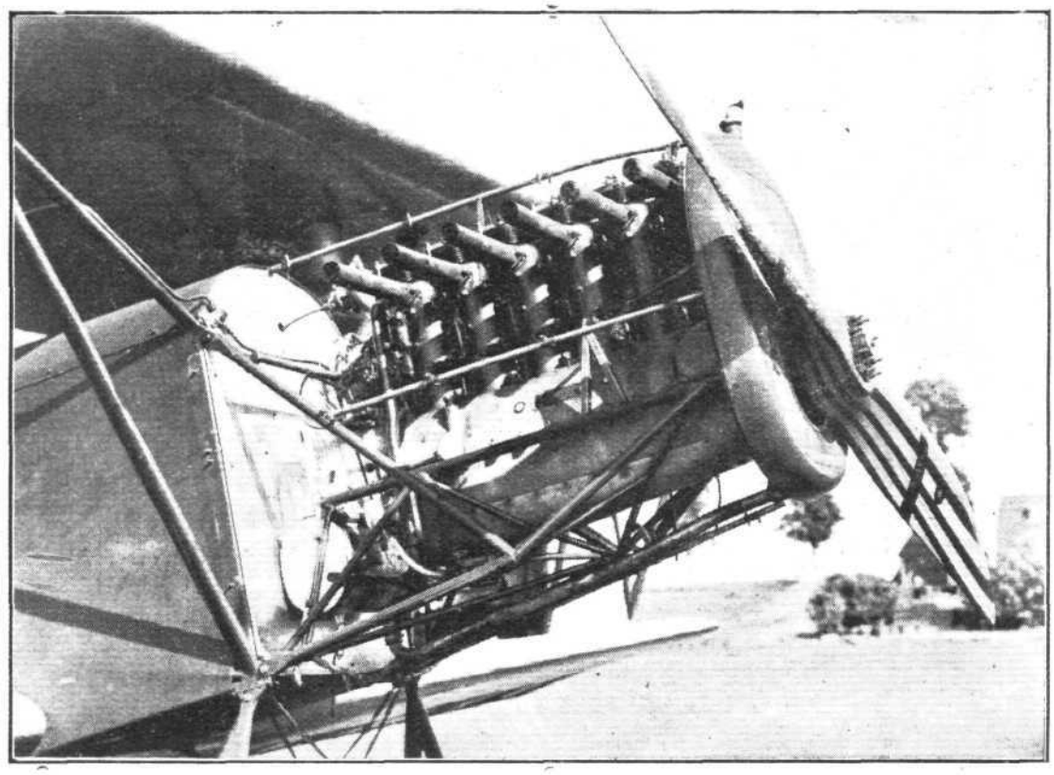


The Fokker C.VI, with B.M.W. engine and nose radiator.

fabriek, but it will probably not be long before the main works are transferred elsewhere. Already the firm has another factory at Veere, where most of the wing construction is carried out and the present Fokker factory at Paparverweg is mainly employed on experimental work. Add to this the fact that the Schiphol aerodrome is on the opposite side of Amsterdam from the present Fokker works, and it will be realised that this is scarcely an ideal arrangement. When Fokker took over the Elta buildings after the closing of the Show in 1919, there was considerable uncertainty as to whether any orders would be forthcoming, and it was not thought wise to launch out into heavy expenses for permanent works that might be without orders. Since that time, however, the factories have become very busy, supplying aircraft to all parts of the world. The present arrangement is now regarded more in the nature of a necessary evil, until better accommodation can be found. This we understand may be announced at any moment now, when it is hoped that a new Fokker factory will house all its departments together under one roof.

On the day of our visit to the Fokker works but a relatively small number of machines were to be seen, as it so happened that a batch had just been delivered, while most of the experimental machines completed were out on the Schiphol aerodrome. Sufficient could, however, be seen to indicate that, in spite of their somewhat temporary character, even the present works would be capable of quantity production on a not inconsiderable scale. On the normal work going on in the Fokker factory it is not proposed to dwell here, but rather will we turn to the experimental and test departments, in which was to be seen much that was of great interest.

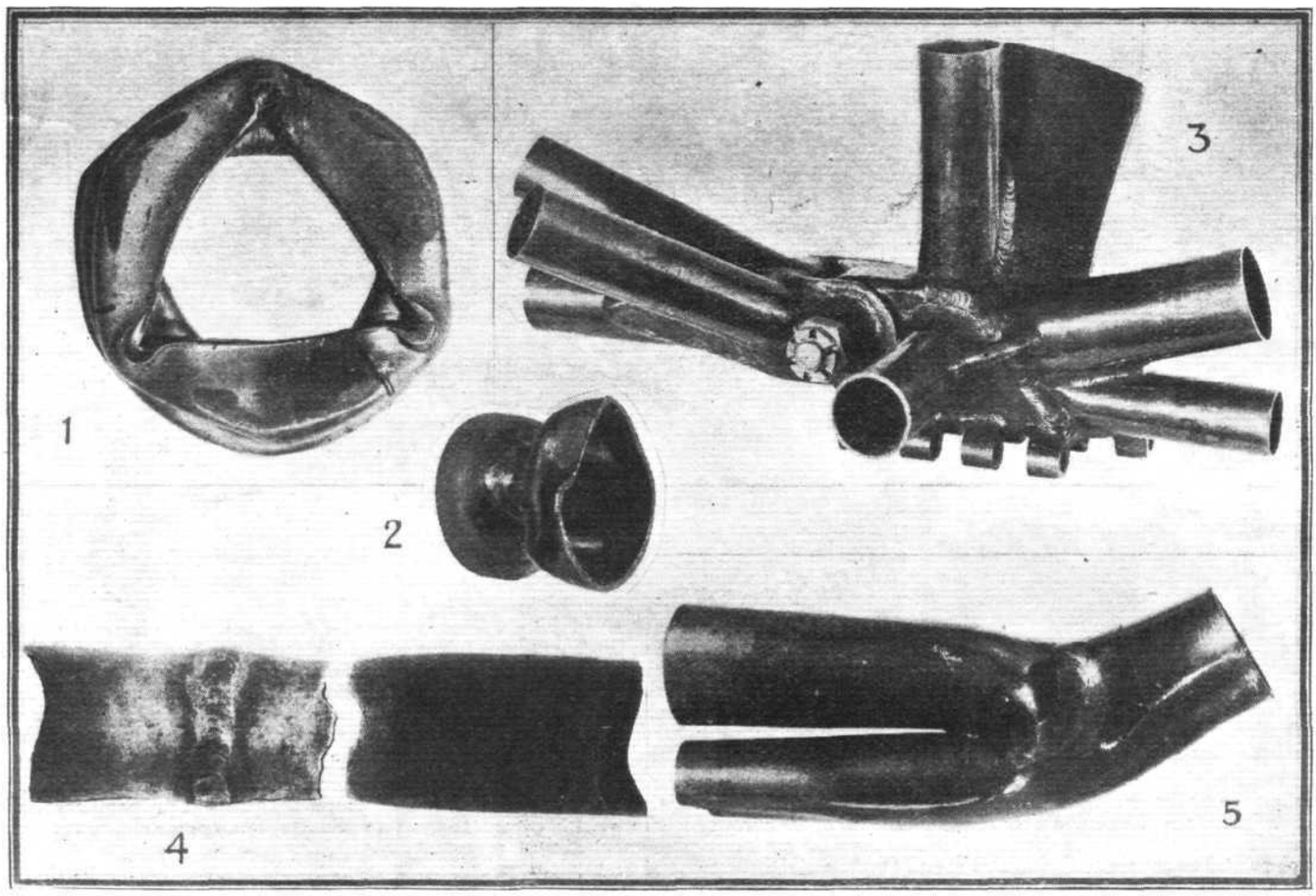
Our visit to the Fokker works helped to solve a question which had often puzzled us—namely, how in constructing an experimental type of fuselage, the number of tubes running at various angles were cut to size and fitted. We had known, of course, that the Fokker method of welded-steel tube construction was claimed to be very simple and very adaptable, but we had been under the impression that, although this might apply to construction on a quantity-production basis, it would be a rather different story as regards the building of individual experimental machines. It was discovered, however, that even this kind of work is carried out with the greatest ease in the Fokker factory. It is, obviously, impossible for us to devote sufficient space to go into great detail, but, briefly, the system employed is as follows:—When a new fuselage is being produced, full-size drawings are got out, from which the size and length of tubes to be employed in any particular position are measured off direct. The workman places a length of tubing on his full-size drawing and marks off the required length. If the tube does not form a right angle with the other tube to which it is to be joined, the workman marks off the angle on the actual tube and then makes a small cut with a hack-saw. With a pair of ordinary tinsmith's shears he then cuts round the marking on the tube with the greatest of ease, and any slight further fitting which is required may be completed by the aid of a file. In erecting the fuselage the two tubes that are to be joined together are held in position, relative to one another, by a workman, while the welder puts on two or three spot-welds, which are just sufficient to hold the tubes in the required position. Should the angle not be quite correct, or should one tube be slightly out of its proper plane, it is a very easy matter for the welder to change the angle, since there is sufficient elasticity in the steel wall of the tube and of the spot-welds to give to some considerable extent. When the tube has thus been lightly pulled into its proper position the weld is completed. The process sounds amazingly crude, but in actual fact it is extremely effective, and it would, indeed, be difficult to imagine anything more simple than the welding process as employed in the Fokker works. From the foregoing it will be realised that the task of completing a new fuselage, *i.e.*, one of different proportions, is an extremely simple one, and one begins to realise how it is that Fokker can turn out such a surprisingly large number of new types. The bugbear of premature standardisation is entirely elimi-



The latest type of B.M.W. engine in the Fokker C.VI.

nated by his method, and a fuselage larger or smaller than any existing type can be produced in this manner in a very short time.

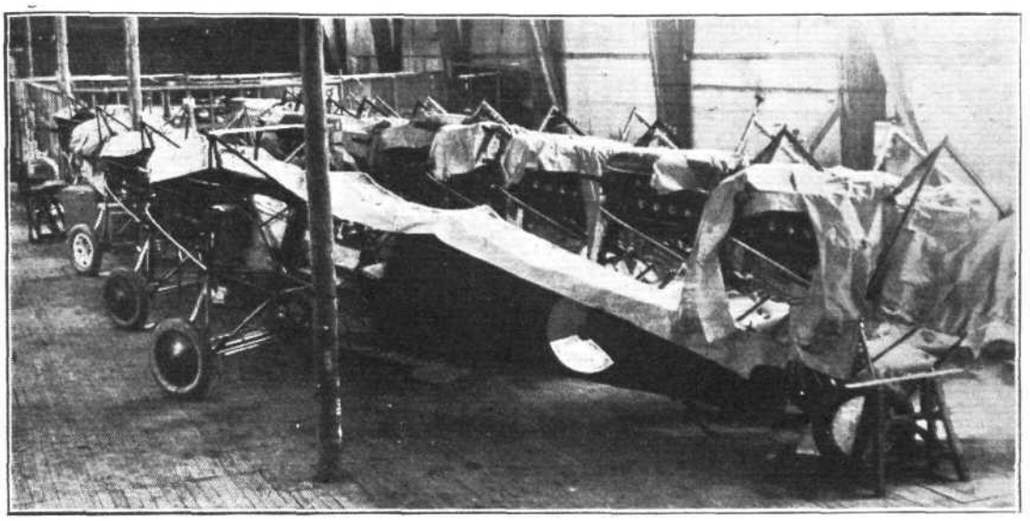
When a machine has been put into quantity production a somewhat different system is employed, and jigs are then constructed on which the fuselages are built, the jigs holding the four longerons in place while the struts are being welded to them. The work progresses with surprising speed, and Mr. Stephan informed us that it only took something like a fortnight to discover whether a man or woman had any aptitude for welding. At the end of a fortnight's welding it was quite obvious whether the person was ever likely to make a good welder or not, and for quantity-production, at any rate, the necessary skill, which is really very small,



SOME EXAMPLES OF FOKKER WELDING : 1 and 2 illustrate what welded tubing looks like after undergoing compression tests. 3. A typical Fokker welded tubular steel joint where eight members meet, not counting the undercarriage struts, which go to the hinged fitting shown underneath. 4. A piece of tubing with welded but joint, after having undergone tension tests. 5. This was originally a welded " T " joint ; this weld has been tested by bending one tube through an angle of approximately 90°.

is readily acquired. Unless by the end of a fortnight the apprentice can make reasonably good welded joints, it is nearly always safe to assume that he never will make a good welder.

On the questions of repairs we were somewhat curious as to how these are effected, but even here the simplicity of the Fokker method was obvious. In this connection we cannot refrain from briefly referring to an experience of Mr. Stephan while he was in the Technical section of the Royal Dutch Air Service. Mr. Stephan frankly admits that he was somewhat doubtful of the merits of the Fokker welded-steel tube construction, but when some machines used by the Royal Dutch Air Service were damaged at the Air Service station, he was faced with the task of repairing them. At the time he knew nothing very much about how to tackle the job, and he put it off as long as he decently could, but at last the time came when something had to be done with the machines. The fabric was stripped from the fuselage and men were set to work with hack-saws cutting away any tubes that had been bent or dented. Fresh tubes were obtained and suitable lengths were sawn off, *the fresh lengths being inserted in place of the original tubes that had been removed, and welded into place.* The process sounds somewhat risky, and we frankly confess that until we had visited the testing department of the Fokker works we felt very sceptical about this method of effecting repairs. Mr. Stephan himself was, we believe, rather astonished when the repairs turned out to be successful, and from that day onwards he began to become converted and to see the real merits of the Fokker system of welded-steel tube construction, with which, since joining the firm, he has, of course, become more intimately acquainted and concerned.



A batch of Fokker machines with Napier "Lion" engines in the Fokker factory at Amsterdam.

In the laboratory of the Fokker works we were privileged to see a series of tests being carried out on samples of steel tube, partly mechanical and partly chemical tests, to ascertain the composition of the material, *i.e.*, carbon contents, etc., and partly tests to ascertain the strength of various welded joints.

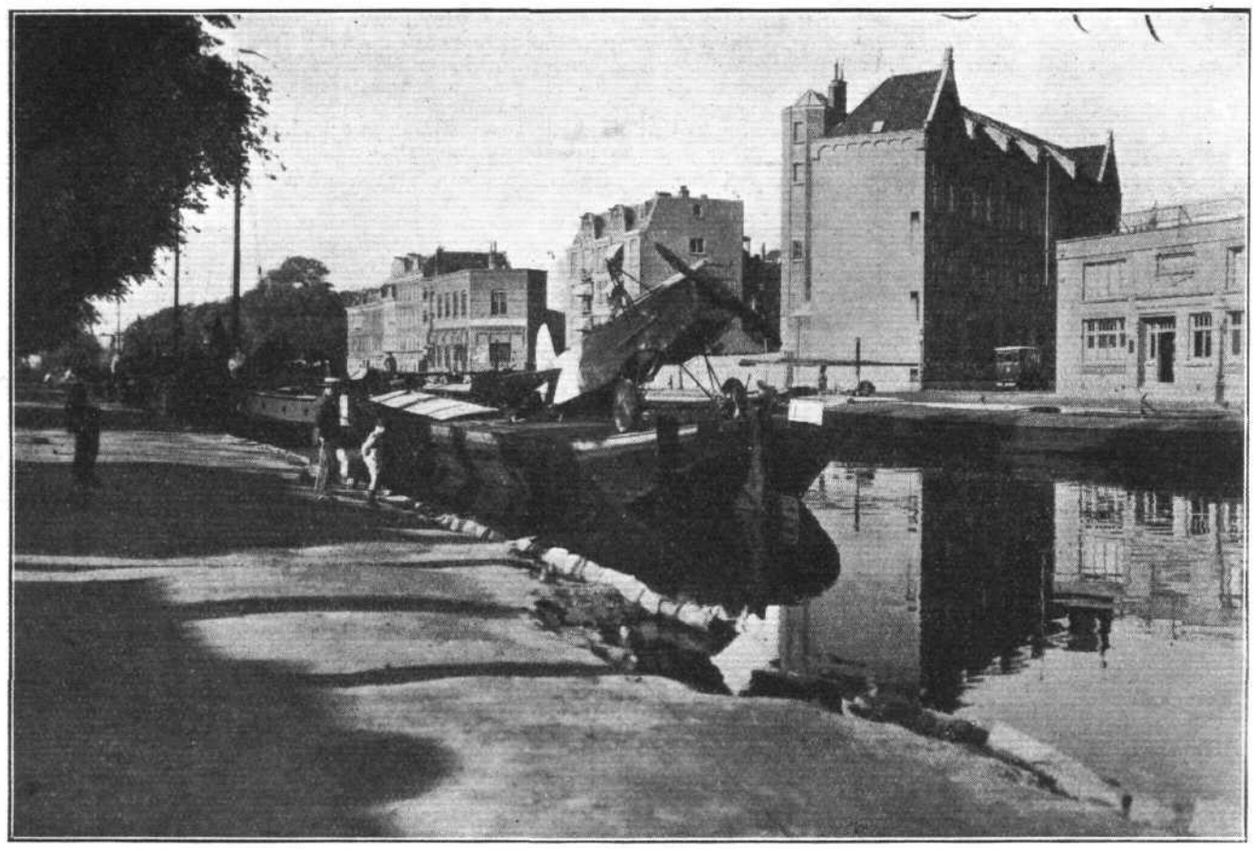
With regard to the former it may be remembered that Mr. Fokker, in his lecture before the Institute of Aeronautical Engineers, gave the composition of the steels which he employs for his special form of construction, and that these are of a type that would not be accepted by the British Air Ministry, being mainly more or less in the nature of ordinary mild steels. For the purposes of the special form of welded construction developed by Mr. Fokker, this grade of material has been found preferable to higher-grade materials which could not be welded conveniently, or, at any rate, with the same facility.

As regards the tests on welded steel joints, we witnessed both tensile and compression tests, and in no single instance while we were in the laboratory was the joint itself found to fail. In the compression tests the tube walls on each side of the welded joint "concertinæd," while in the tensile tests the tube broke on one side of the welded joint, but never in the joint itself. It would, therefore, appear that even for joints designed to work in tension the welded joint, which, by the way, was in the form of a perfectly plain straight-forward butt joined without overlapping, is perfectly satisfactory, provided an allowance is made for the decrease in the strength of the material itself, caused, of course, by the heating during the welding operation. One of the accompanying photographs shows such a test piece, and it will be seen that while the joint itself is perfectly sound, the tube on one side has contracted during elongation, while on the other side of the joint the tube itself broke. The actual amount by which the strength of a tube is decreased under the action of heat varies according to the composition of the steel, but, generally speaking, it is, we understand, round about 20 per cent. In other words, in stress calculations, instead of using the figure representing the strength of the untreated tube, about 80 per cent. of that figure is taken. Other photographs show compression test pieces, and in no instance has the welded joint itself failed. Finally, one of the photographs shows a most complicated joint, or what would have been a most complicated joint with methods other than welding. In this joint no less than eight members meet, not counting the undercarriage struts which are hinged to the lower longeron by the hinges shown in the photograph. The bolt joint on the left is of the detachable engine mounting, which is now so designed in all Fokker makes so that it can be removed by undoing four bolts.

It is probably too much to expect, but we cannot help hoping that the British Air Ministry may be persuaded to abandon its present attitude towards welding. Not that we suggest that the British aircraft constructors should slavishly copy the Fokker system, but we do think that they should be permitted to develop methods of their own, somewhat along the same lines.

After spending several hours at the Fokker factory Mr. Stephan kindly undertook to transport us to the Fokker sheds at the Schiphol aerodrome, which lies on the opposite

Mr. B. Stephan, general manager of the Fokker works, standing by a Fokker biplane with Napier "Lion" engine.



ANCIENT AND MODERN: A Fokker biplane being transported on a barge by canal from the factory to the Schiphol aerodrome.

side of Amsterdam, and several kilometres out. On the way we stopped for lunch in most charming surroundings at the Pavilion in Vondel Park. The Schiphol aerodrome itself is a fairly large one for Holland, but the surface is not altogether beyond reproach, although everywhere improvements are gradually being effected. Schiphol, is, of course, the permanent civil aerodrome or rather one section of it is, the other being occupied by the Royal Dutch Air Service. On the latter we saw a number of Fokker machines of various types, some of very recent manufacture, which are still undergoing tests, but from which great things, particularly in the way of climb, are expected. Among these machines we mention but two—a new Fokker C VI, with the latest type B.M.W. engine, which is shown in one of our photographs, and the Fokker D. XIV., a low wing monoplane which was illustrated in FLIGHT some weeks ago. The latter is of interest for various reasons, but particularly on account of its undercarriage, which is of unusual type. Owing to the fact that two of the undercarriage struts run to the wing spars, the usual shock-absoring gear could not very well be employed, and so a new form of spring wheel was evolved, in which the rim is anchored to the hub by rubber shock absorbers, suitable plates keeping the rim of the wheel centrally over the hub in a vertical plane, but allowing the hub and axle to move up and down within the rim.

A short visit was also paid to the civil aerodrome at Schiphol, where a most comfortable hotel is available for air travellers, and where the idea that one cannot get good tea outside Great Britain was effectively disproved. On the return journey to Amsterdam in Mr. Fokker's "Lancia" car, we were held by by a barge going through a bridge. This, we understand, is one of the little drawbacks to the development of modern transport in Holland, as, although one may arrive from Berlin or London by the most rapid means of transport, one is liable to be held up for twenty minutes or so on the way to the centre of Amsterdam. In our case the delay was not regretted, however, since as luck would have it another barge came along carrying a dismantled Fokker machine, and that thus our photographer was afforded an opportunity of securing the picture published in this article, of the latest vehicle of transport being conveyed by what is perhaps one of the most ancient. At the very fine Central station of Amsterdam we bid good-bye to Mr. Stephan, who had, we fear, given us much more of his valuable time than we had any reasonable claim upon.

◈ ◈

World's Records Beaten by Fokker-Napier Machine

ON June 16 Engineer Grasé, Chief of the Scientific Department of the N.V. Nederlandsche Vliegtuigenfabriek "Fokker," beat the world's speed records over 100 and 200 km. with a useful load of 250 kg. and 500 kg. (not including pilot and fuel). These four new records have now been homologated by the Dutch Royal Aero Club as follows: Over 100 km., 266·6 km./p.h. (165·7 m.p.h.), and over 200 km. 265 km./p.h. (164·7 m.p.h.). The holders of these records were: Doret (France), Dewoitine monoplane, 231 and 226 km./p.h. over 100 and 200 km. respectively with 250 kg. useful load and Descamps (France), De Monge monoplane, 221 and 217 km. p.h. over 100 and 200 km. respectively with 500 kg. useful load. The machine used was a standard "Fokker" D. XIII scout with a 450 h.p. Napier "Lion" engine. A series of this type was built last year and a sample was exhibited at the last Paris Aero Show. Although this is not the first time a Dutch aeroplane had captured a world's record, "Fokker" machines having put up world's records in other countries, but when the records mentioned above are registered by the F.A.I. it will be the first time that a world's record has been beaten by a Dutchman in Holland on a machine of Dutch design and manufacture.

◈ ◈

New York-Chicago Night Air Mail

FROM the Aero Club of Illinois, Chicago, comes an interesting souvenir of the inauguration of the night air mail service between New York and Chicago. This takes the form of a "flown cover," carried on the first night trip from Chicago, containing the following message: "Congratulations on the Growth and Usefulness of Airplane Service. The Inauguration of Night Air Mail is a Marked Step in Advance. With Best Regards. The Aero Club of Illinois, Chicago, U.S.A." This was enclosed in the special official Air Mail envelope bearing the red-white-and-blue band and "label" stating "Via Air Mail. Envelopes of this design approved by P.O.D. for exclusive use in Air Mail." In addition, is an imprint in red, viz.: "Air Mail. First Overnight Flight Chicago to New York." The Chicago postmark is July 1, 7 p.m., and the New York post-mark (on reverse) is July 2, 8 a.m.

FLIGHT

THE ROYAL AERO CLUB OF THE U.K.

OFFICIAL NOTICES TO MEMBERS

LONDON AEROPLANE CLUB

THE two D.H. "Moth" machines acquired by the London Aeroplane Club will, it is hoped, be handed over within the next ten days.

Two pilot instructors have been engaged, Mr. F. G. M. Sparks and Mr. G. T. Witcombe.

Owing to the large number of applications, the list of flying members has now been closed. It is hoped, however, to elect additional members as soon as it is ascertained to what extent the machines are used by the present membership.

The following Committee has been elected to control the London Aeroplane Club:—

Wing-Commander T. O'B. Hubbard, M.C., A.F.C.; Lieut.-Col. F. K. McClean, A.F.C.; Major R. H. Mayo; Col. The Master of Sempill; Capt. C. B. Wilson, M.C.

AUGUST RACE MEETING AT LYMPNE AERODROME, ON AUGUST 1, 2 and 3, 1925

MEMBERS and Associates of the Royal Aero Club and the London Aeroplane Club will be admitted free on presentation of their membership cards.

The programme each day will commence at 11 a.m. Luncheon and teas may be obtained on the Aerodrome.

Private Owners' Handicap

Aeroplanes owned by clubs will be regarded as "Privately owned" for the purposes of this race.

AUGUST RACE MEETING

(Under the Competition Rules of the Royal Aero Club and the Regulations of the Federation Aeronautique Internationale)

At Lympne Aerodrome, near Hythe

THE following races will be held on Saturday, Sunday and Monday, August 1—3, 1925. Entry forms can be obtained upon application to the Royal Aero Club, 3, Clifford Street, London, W.1. All entries close at 5 p.m. on Friday, July 24, 1925.

1. International Handicap.—Open to all aeroplanes. The race is over a distance of approximately 100 miles, comprising eight circuits of the course.

First prize, £150. If five starters, the second will receive £50. Entry fee, £2.

2. Grosvenor Challenge Cup Handicap.—The aeroplane and engine must have been entirely constructed in the British Empire. The weight of the engine must not exceed 275 lb. The entrant and pilot must be British subjects. The entrant must be an individual and not a company. The race is over a distance of approximately 100 miles, comprising eight circuits of the course.

First prize, £100; second prize, £50. Entry fee, £2.

3. Light Aeroplane Holiday Handicap (International).—Open to light aeroplanes (single- and two-seaters). The weight of the engine must not exceed 170 lb. The race is over a distance of approximately 50 miles, comprising four circuits of the course.

First prize, £100. If five starters, the second will receive £25. Entry fee, £2.

4. Single-seater Light Aeroplane Scratch Speed Race (International).—Open to light aeroplanes (single-seaters). The weight of the engine must not exceed 120 lb. The race is over a distance of approximately 50 miles, comprising four circuits of the course.

First prize, £50. If five starters, the second will receive £20. Entry fee, £2.

5. Two-Seater Light Aeroplane Scratch Speed Race (International).—Open to light aeroplanes (two-seaters). The weight of the engine must not exceed 170 lb. The race is over a distance of approximately 50 miles, comprising four circuits of the course.

First prize, £50. If five starters, the second will receive £20. Entry fee, £2.

6. Private Owners' Handicap (International).—Open to all aeroplanes, privately owned and registered in the name of an individual. (The definition of "Privately owned" is to be at the sole discretion of the Royal Aero Club.) The race is over a distance of approximately 50 miles, comprising four circuits of the course.

First prize, £100. If five starters, the second will receive £25. Entry fee, £2.

7. Inter-Club Race.—Open to D.H. "Moths" owned and entered by the Light Aeroplane Clubs. It will be a scratch race over a distance of approximately 50 miles, comprising four circuits of the course.

First prize, £100. If five starters, the second will receive £25. Entry fee, £2 per aeroplane.

8. Certified Performances for Light Aeroplanes.—Single-seaters and two-seaters. The weight of the engine must not exceed 170 lb.

The Royal Aero Club will give certificates of performance in the following classes:—

Class I.—Height in a given time—30 minutes.
Class II.—Greatest speed over 3 kms.
Class III.—Greatest speed over 50 kms.
Class IV.—Height.

A prize of £25 will be given for the best performance in each class.

Prizes will only be given in classes where there are at least three competitors. Entry fee, £1 for each class.

In all cases where aeroplanes are entered as two-seaters a passenger must be carried, and the weight of the pilot and passenger must be at least 340 lb. Any shortage of weight must be made up with ballast.

Where the weight of engine is specified, this will include carburettor and induction system, complete ignition equipment, air-screw hub and fastenings, exhaust pipes (if any) and radiator, pipes and water (if any).

Offices: THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W. 1.
H. E. PERRIN, Secretary

The Press and Aviation

THE Secretary of State for Air, Sir Samuel Hoare, and Air-Commander C. D. Burney, were entertined at the Luncheon of the Institute of Journalists (London District), held at Anderton's hotel last week. Mr. E. P. Webb, Chairman of the London District, presiding.

Expressing his thanks to the Press for the help they had given him in building up our Air Force and developing British aviation generally, Sir Samuel Hoare referred to the great difficulties which confronted the Air Ministry at the present time. They were endeavouring to treble this branch of their fighting forces, when, unfortunately, there was too little loose money about. While we were now at peace, we had to recognise the claims of the nation's safety, and, of course, the claims of the taxpayer for economy had also to be reconciled. He was constantly conscious of the fact that the Air Force and aviation generally might mean more to Britain in the future than to any other country in the world. Air power, he said, had entirely revolutionised the whole system of our home defence, and the development of air power might in the future revolutionise the whole system of Imperial communication.

Commander Burney referred to the development of commercial aviation and the speeding up of all services if they were to maintain the Empire as a political and economic entity. If they could bring Montreal within 48 hours of London, Cape Town within three or four days, Australia within six or seven, and India within four, it would facilitate the building up of public opinion by the greater ease with which the Press could collect and distribute news and opinions on Imperial matters. He hoped that the Press, by the support they were giving to airship development, were assisting in laying the foundations of a service which might revolutionise the whole British Empire, in the same manner as its advent had revolutionised the whole system of our defence.

Royal Air Force Display Attendance

THE official figures of the attendance and receipts at the Royal Air Force Display on June 27 are now issued, the former numbering 100,000; and the receipts are estimated at nearly £10,000. Despite the fact that interest in aviation in this country is not as general as it might or should be, these figures which constitute a record, are concrete evidence that the outlook of the general public is developing to a realisation of the vital importance of the "air arm."

LIGHT 'PLANE AND GLIDER NOTES

SINCE our last reference (FLIGHT, June 18) to the Vauville Light 'Plane and Glider meeting, which is being held from July 26 to August 9, entries for this meeting have now definitely closed with 34 machines, 17 of which are gliders and the remaining 17 light 'planes. For the convenience of our readers we give herewith the full list of entries, repeating those previously given, but for details of the meeting itself we would ask our readers to refer to our June 18 issue. It may be mentioned that the machines in the competitions will carry the same numbers as those given in the list below. Five countries will be represented—the letters in brackets indicating each country in our list. Belgium (B.), France (F.), Holland (H), Hungary (Hy.), Roumania (R.).

The full list of entries is as follows :—

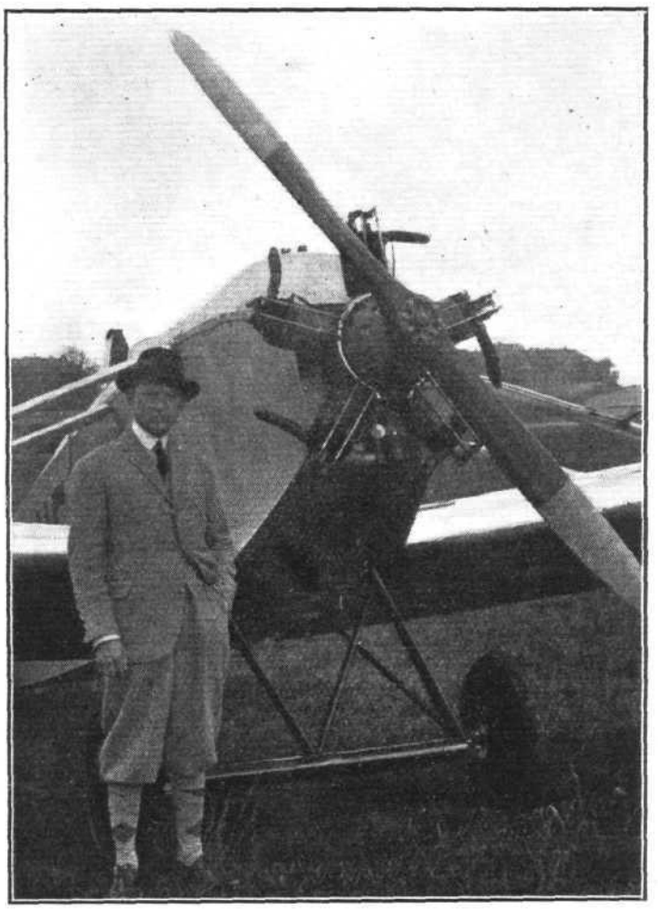
Nos. 1, 2 and 3, S.A.B.C.A., light 'planes, (B.) ; 4, Georges Ligreau, light 'plane (F.) ; 5 and 6, H. Pander en Zoonen, light 'planes, (H.) ; 7, Eric Nessler, glider, (F.) ; 8, H. and M Farman, light 'plane, (F.) ; 9, Henry Potez, light 'plane (F.) ; 10, Victor Simonet, Poncelet glider, (B.) ; 11, Briens-Chapeaux light 'plane, (F.) ; 12, Bardin-Alérion, Bardin glider, (F.) ; 13, C. Jonesco, light 'plane (R.) ; 14, Robert Ferber, glider (F.) ; 15, Georges Sablier, glider, (F.) ; 16, Bourriau-Chapautau, glider (F.) : 17, Aero Club Sablais, glider, (F) ; 18, Alfred Auger, Pega glider, (F.) ; 19 and 20, Louis Peyret, light 'plane and glider, (F.) ; 21, J. Rolle, glider, (F.) ; 22, M. Rousset, glider, (F.) ; 23, Leon Gateu, light 'plane, (F.) ; 24, Marcel Lallouette, glider, (F.) ; 25, Liptak-Korb, glider, (Hy.) ; 26, T. Rillet, glider, (F.) ; 27, E. Albert, Tellier light 'plane, (F.) ; 28, Caudron, light 'plane, (F.) ; 29, Jean Richard, Poncelet glider, (B.) ; 30, Lieutenant Demblon, Glymes glider, (B.) ; 31, Landes-Bréguet, glider, (F.) ; 32, V. Simonet, S.H.B.P. light 'plane, (B.) ; 33, S.A.B.C.A., Mulot light 'plane (B.) ; and 34, Pierre Carmier, light 'plane, (F.).

* * *

THE Beardmore "Wee-Bee I" light monoplane, with Bristol "Cherub" engine, has been doing a fair amount of flying lately at Renfrew aerodrome, and among other flights was one to an altitude of 14,500 ft. as indicated by the barographs. These have, we understand, been sent to the National Physical Laboratory for testing, so that the figure is open to correction, but probably it will not be found to be very far out. This is, of course, a very creditable performance on the part of the "Wee Bee," but we scarcely think it is the maximum altitude of which the machine is capable. In point of fact, we should imagine that were everything working properly, this machine should have a ceiling of round about 20,000 ft. It is good news that some of last year's light 'planes are still being made use of.

* * *

A SHORT time ago a very fine flight was made from Prague to Rome and back by the Czecho-Slovak pilot, Dr. Lhota, on an Avia B.H. 9 with 60 h.p. "Walter" engine. Leaving Prague at 4 a.m. on May 16, Dr. Lhota reached Bologna in Italy at 3 p.m. on the same day. Here he was obliged to wait for better weather conditions before crossing the Appennines, which were entirely covered in cloud. The next day Dr. Lhota found better weather, and arrived at the Centocelle aerodrome, near Rome, during the morning. After a stay of some days in Rome, and at Pisa, he started on the return flight from Pisa on May 29, taking the route over Belgrade and Budapest, and arriving at Prague on the morning of June 1. The distance covered was something like 3,550 kms. (2,200 miles), in a total of 29 flying hours. The flight was covered in the following stages : Prague–Bratislava–Trieste–Bologna–Rome–Pisa–Bologna–Udine–Zagreb–Belgrade–Novi Sad–Budapest–Bratislava–Prague.



Dr. Lhota standing by the Walter engine of his B.H.9 monoplane, on which he flew from Prague to Rome and back.

PRAGUE-ROME-PRAGUE : Dr. Lhota, the well-known Czech pilot, recently flew from Prague to Rome and back in this Avia B.H.9 fitted with 60 h.p. Walter engine.

FLIGHT

A BASIS FOR LIGHT 'PLANE COMPETITIONS

Some Suggestions for Consideration

SOME weeks ago reference was made in our Editorial Comment to the basis which is suggested for the light 'plane competitions to be held in 1926, and it was pointed out that this basis, *i.e.*, a limit of engine weight to 170 lbs., so far from tending towards the production of cheaper machines, would be more likely to form a direct incentive to designers to get out of the permitted engine weight the maximum power possible. In order to get the greatest power out of a given weight of material it becomes necessary in the first place to use the very highest grade materials, and to employ them in the most efficient way. This means high-cost and super-efficiency. It is fairly certain that if low-power flying is to become at all popular, one of the very first considerations is that of cost, and, therefore, to base the competition, which is supposed to encourage and assist popular flying, on a restriction which does not take the question of cost into consideration at all, is obviously attacking the problem at the wrong end. Personally, we would far rather see some diametrically-opposed method employed, such as commencing with a certain price of machine, and then let competitors try what they could do in the way of performance without exceeding that figure. We are afraid, however, that this would scarcely be possible, since it might not be an easy matter to decide on a figure of price.

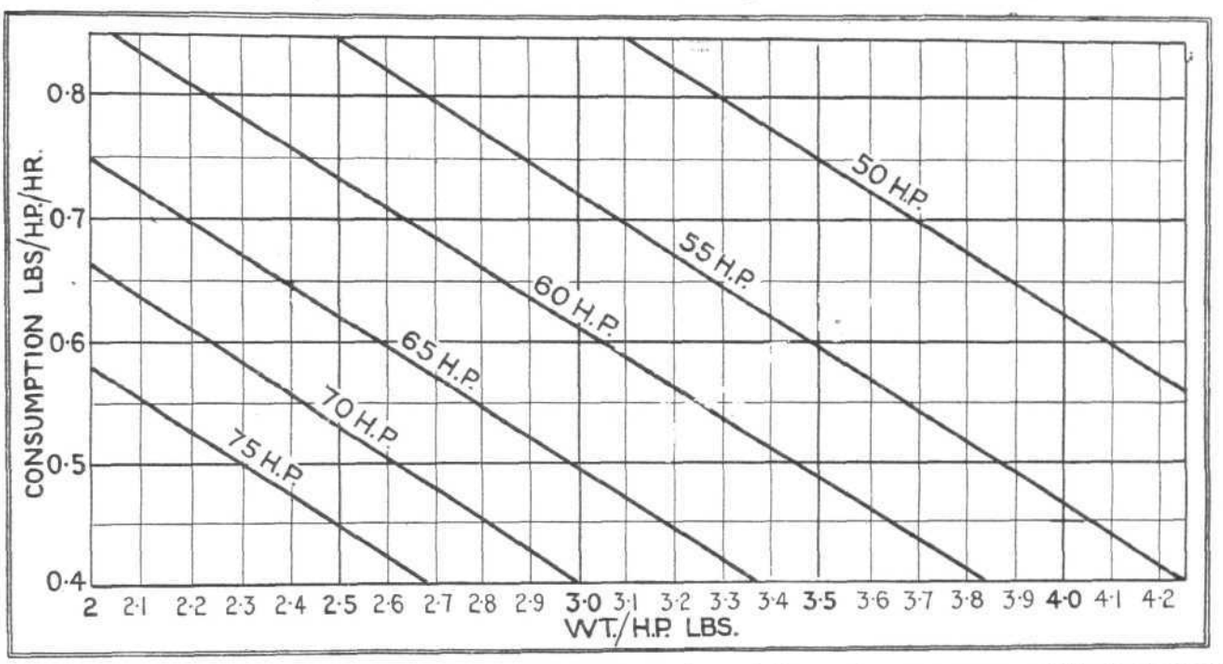
In the article to which we refer above, we suggested that, instead of taking engine weight as a basis, a sounder scheme would be to take the weight of engine plus the weight of fuel and oil consumed during four hours at full power, and we suggested that this figure might be 325 lbs. This particular figure was chosen somewhat arbitrarily, of course, but would seem to form a reasonably good basis on which to work. If, after going further into the subject, those responsible for drafting the rules should decide that this figure is too high, it could be limited to 300 lbs., or even to 275 lbs. Under no circumstances, however, do we think the figure of 325 lbs. should be exceeded.

In order to show in a convenient manner how this scheme would be likely to work out, we have prepared the accompanying graph, which shows the weights per horse-power and consumption permissible within the limit of 325 lbs., the horse-power considered ranging from 50 h.p. to 75 h.p. The lower figure will probably represent, approximately, the minimum horse-power with which a really serviceable machine could be produced, while 75 h.p. is about the maximum that one could expect to attain within the limit of 325 lbs.

An examination of the curves shows that with an engine of 75 h.p. weighing 2·25 lbs./h.p., the petrol and oil consumption must not exceed 0·515 lbs./h.p./hr. To get the engine weight down to 2·25 lbs./h.p. would require the use of high-quality materials and skilful design, while the petrol and oil consumption of 0·515 lbs./h.p./hr. would mean an engine of very high efficiency. Choosing this basis of 325 lbs. would, therefore, definitely seem to have the effect of limiting the maximum horse-power to about 75.

If 50 h.p. were considered to be sufficient for giving the performance required of light 'planes, then it will be seen much higher weights per horse-power and a much higher consumption becomes permissible without exceeding the limit of 325 lbs. Thus, with an engine-weight of 3·75 lbs.-h.p. the consumption could be 0·685 lbs./h.p./hr., while by decreasing the engine weight to 3·3 lbs./h.p. the consumption could be as "bad" as 0·8 lbs./h.p./hr.

In between these two extremes a number of horse-powers and weights would, of course, be possible, and our graph shows at a glance the combination of power, engine, weight, and consumption which would give the weight upon which we have decided as a maximum. If this figure of weight were decreased it would mean either a decrease in the horse-power for the given weights, or a more refined engine for a given horse-power. It would, of course, be quite easy to use the graph for other weights, simply by multiplying the scales by the number corresponding to the ratio between the new weight chosen as a limit, and the old weight of 325 lbs. We think, however, that the figure chosen forms a fairly good basis; at any rate, sufficiently so for a discussion of the subject.



LIGHT 'PLANE ENGINES: The curves in this graph show the weight per horse-power and the fuel consumption permissible if the total weight of the engine and oil and fuel for four hours is limited to 325 lbs. At the upper end of the scale 75 h.p. with a weight of 2.25 lbs./h.p. and a consumption of 0.515 lbs./h.p./hr. would seem to mark the limit. If a lower horse-power is found sufficient, both the weight of the engine and the consumption per horse-power may, of course, be considerably higher without exceeding 325 lbs.

Limiting the weight of engine and fuel in the manner suggested does not, of course, in itself provide a basis for judging machines, but is merely the *condition* for machines to be admitted to any competition that may be decided upon. In order to have a starting point on which to work it may be of interest to formulate a scheme. Not that we have any hopes that those responsible for drawing up the rules for next year's competition will adopt our scheme as it stands, but we hope that it may serve to demonstrate that it is possible, without excessive complications, to draw up a scheme more likely to produce low-price machines, than that of limiting engine weight only. We wish it to be clearly understood that we do not claim for FLIGHT the credit of suggesting that the question of price should be taken seriously into consideration. This suggestion was first made at a meeting

of the Royal Aeronautical Society, by Sir Henry White Smith, who proposed that for any future light 'plane competitions entrants of machines should be required to state the price at which they were prepared to sell their machines in batches of 25 or 50. All we claim to have done is to take this suggestion and to incorporate it in the scheme outlined in the following notes. Briefly, then, the scheme is as follows :—

1. Limit the engine power by placing a limit of 325 lbs. on the weight of the engine itself plus the fuel and oil it consumes in four hours at full power.
2. Awarding marks for whatever performances are thought to be desirable.
3. Divide the number of marks so awarded to competitors by a figure representing, either directly or otherwise, the price at which entrants are prepared to supply their machines in batches of 25.

It is, of course, realised that such limitations would necessitate the very closest co-operation between engine designers and aircraft designers, since no aircraft manufacturer would be able to estimate figures of cost unless he knew definitely the price at which he could obtain the particular engine he was using. This, however, would by no means be an evil, and in the past there has, we are afraid, been too little co-operation between the engine designer and the aeroplane designer. It is, of course, evident that there would be difficulties in committing oneself to such a figure of cost, and in any case this figure would very largely depend upon the attitude of the Air Ministry. To a great extent it rests with the Air Ministry itself to bring the price of machines down by leaving aircraft constructors a free hand in the choice of materials and in the particular use made of the materials. Certain methods of construction are now banned by the Air Ministry which are giving excellent results elsewhere. A case in point is the Fokker system of welded steel tube fuselage construction. We mention this particular case not because we necessarily regard this form of construction as being particularly suitable for light 'planes, but as an instance of how the Air Ministry, by vetoing a cheap form of construction, is preventing cost from being reduced. Another stumbling block to cheap construction is the insistence by the Air Ministry of inspection of every part that goes into an aeroplane. Until all these stupid restrictions are removed there is little hope of getting the cost of light 'planes down to reasonable figures. If the Air Ministry is really serious in its desire to popularise aviation, then it could do so in no better or surer way than by withdrawing all interference with the manufacturers. As we have repeatedly pointed out in FLIGHT, British aircraft firms can be depended upon not to turn out unsafe machines. The reputation of a firm is something which no sane man would jeopardise for the sake of being able to save a few pounds, but, if left to themselves, we are quite sure that British aircraft designers and constructors would be able to produce light 'planes of ample strength in every way, simply by devising methods of construction different from those at present in use. All that is required is that they should not be hampered by official interference.

Doubtless, the costing departments of the firms would have rather a hectic time, and it would obviously not be possible for firms to state their price when first entering the machine, nor should there be any need for them to do so, although the statement of cost should, of course, be made before the actual start of the competition. To remove any uncertainty, it would obviously be necessary, or rather desirable, that the Air Ministry should commit itself to ordering a batch of the machines gaining the highest award, and to encourage the cheap machine to some small extent, it might be advisable to put in a clause to the effect that where more than one machine obtained the same number of marks, the prize should go to the machine selling at the lowest price.

It is, of course, somewhat difficult to forecast accurately how such a scheme would work, but, in order to obtain some idea, and so as to get a basis for discussion, we might assume that the competition itself would be of the same nature as that held at Lympne last year, *i.e.*, marks awarded for greatest speed range, quickest take-off, and shortest pull-up. Not that we necessarily consider that this is the best possible method of comparing performances, but for the time being it will serve as a basis. The speed range in last year's competition was, it may be remembered, based upon the formula

$$\frac{\text{V max.} - \text{V min.}}{\text{V min.}} - 0{\cdot}33$$

in which V max. is the top speed and V min. the low speed. It was stipulated that the low speed must not exceed 40 m.p.h. and no marks were awarded for a speed range of less than 33 per cent. For each m.p.h. speed range, expressed as a percentage, eight marks were awarded. In the take-off competitions machines had to clear an obstacle 20 ft. high in the shortest possible run, and one mark was awarded for each yard by which the distance required was less than 450 yds. In the pull-up competition, machines had to come in over an imaginary hedge 6 ft. high, and pull up in the shortest possible distance beyond the hedge, one mark being awarded for each yard by which the distance required to pull up was less than 150 yds.

For the purpose of our argument, let us suppose that the same kind of competition under the same rules is being held next year, and then let us examine how our suggested scheme might be expected to operate.

If we take as an average light 'plane (in the more modern sense of the term, as indicated by the limit of 325 lbs.), one having an engine of 60 b.h.p. To be within the 325 lbs. this engine could have a weight of 3 lbs. per h.p. (180 lbs.) and a consumption of 0·61 lbs./h.p./hr. It seems reasonable to suppose that with this horse-power and, without going into ultra-refined design, a top speed of 80 m.p.h. could be obtained. If we assume that the low speed of this machine was 38 m.p.h., the speed range would be 42 m.p.h., and the number of marks awarded would be 620. If we further assume that this machine could clear the obstacle with a run of 250 yards it would gain a further 200 marks. By pulling-up in 70 yards the machine would gain 80 marks, or a total of 900 marks. If it is further assumed that such a machine could be sold in batches of 25 at £750, the "figure of merit," which we may term the number of marks gained divided by the price, would be $\frac{900}{750} = 1{\cdot}2$.

At the upper end of the scale we should have a machine designed as efficiently as possible, with an expensive efficient engine. It may be supposed that by careful design such a machine, if fitted with an engine of 75 h.p., weighing 2·25 lbs. per h.p. (169 lbs.), and having a consumption of 0·515 lbs./h.p./hr., could obtain a top speed of 95 m.p.h., and if we assume that the low speed was the same as before, *i.e.*, 38 m.p.h., the speed range would be 57 m.p.h., and the number of marks would be 930. If such a machine could clear the obstacle in 200 yards it would obtain 250 marks for take-off, and by pulling-up in 70 yards it would gain 80 marks, or a total of 1,260 marks. In order to obtain the same "figure of merit" as our "average" machine, the price of the refined machine must not exceed £1,050, and it seems rather doubtful whether such a high-quality machine could be built for less.

At the other end of the scale let us examine the cheap machine, in which a good "figure of merit" is aimed at by a low price, rather than high performance. An engine of 50 h.p., weighing 3·75 lbs./h.p. (187·5 lbs.), could have a consumption of 0·685 lbs./h.p./hr. The top speed might be 70 m.p.h. only, and the low speed 40 m.p.h., giving a speed range of 30 m.p.h., and an award of marks for a speed range of 340. As such a machine would probably have a considerably higher power-loading it seems reasonable to suppose that its take-off would require 300 yards, so that the marks gained under this head would only be 150. There is no reason to suppose that the pull-up would be any worse, and, therefore, we may take that to be 70 yards, giving 80 marks. Thus for the cheap machine, with the performance outlined above, we should obtain only 570 marks. To give the same "figure of merit" as the "average" and the "refined" machines, the cheap machine would have to sell at £475.

Assuming these figures to be roughly representative of the "refined," "average," and "cheap" types of machine, designers would be free to decide for themselves which type was the more likely to attain the higher "figure of merit," and of the three it would seem that if a two-seater capable of doing 70 m.p.h. for four hours could be produced for £475, it would meet the requirements of light 'plane clubs and of most private owners. On the other hand, there is no reason why the probably smaller number of clients who would prefer a more "sporting" machine, and who would be prepared to pay £1,050 for a machine that would give them a top speed of 95 m.p.h., should not be catered for, so that any firm deciding to build this type of machine for this class of customer would be at liberty to do so if it was considered that, with the power of 75 h.p., the assumed performances were attainable, and that the machine could be built for a little over £1,000. It thus seems to us that the scheme, or some such scheme, would definitely tend to limit the power and the cost of light 'planes, and thus it is, we think, worthy of some consideration by those who will be responsible for the future of light 'plane development in Great Britain.

We do not by any means mean to suggest that this scheme is perfect, and, personally, we regard it merely as a basis

for discussion of the problem. Many variations, would, of course, be possible. For instance, if it is thought that dividing the number of marks gained for performance by the cost does not sufficiently encourage the cheaper machines, one could divide by the square of the cost.

To show how this would affect results, we will take the same three types of machine assumed above, and divide the number of marks, not by the price itself, but by the square of the price. On this basis the "figure of merit" for the "average" machine would be 0·0016. For the "refined" machine the "figure of merit" would be 0·00086, and for the "cheap" machine, 0·00253, so that, with the performances and prices assumed, the cheap machine would secure a "figure of merit" of nearly twice that of the average machine, while the "figure of merit" of the refined machine would be roughly one-half that of the average machine.

Looked at in another way this would mean that the three types, to get the same "figure of merit," still retaining the price of £750 for the average machine, the refined machine must not exceed in cost £887, while the cheap machine could cost as much as £593. Thus by dividing with the square of the cost there is a very decided tendency to encourage the cheap machine in preference to the other two, and on the whole it might be preferable to use this basis for judging the types. For this to be successful, however, or even possible, it would certainly be necessary for the Air Ministry to withdraw all interference with private constructors, and if the high-speed tests in the actual competition were made sufficiently severe so that the engine would have to be reliable to get round the required number of circuits, there should be nothing against such a policy. If necessary, the Air Ministry might stipulate that machines, in order to be considered, should possess certain factors of safety, as ascertained either by accepted methods of calculation or by sand-loading tests.

◈ ◈ ◈ ◈

GERMAN AVIATION AND ALLIED RESTRICTIONS

THE Allied Conference of Ambassadors' new and revised schedule of restrictions has now been made public. It was handed to the German Ambassador in Paris on June 24, and since then has called forth much criticism from the Berlin Press. We will here endeavour to unravel the events which have led up to the present impasse.

In the first instance the Versailles Treaty caused numerous restrictions to be placed on German aeronautical activities; the rules based on the restrictions being enforced by the Inter-Allied Air Guarantee Committee. On the occasion of the imposition of these restrictions, it was arranged that the governing rules should be subject to revision once every two years, and in consonance with this arrangement the German Government in March, 1924, submitted a list of concessions which it considered to be justified.

The new schedule recently published, and which has aroused something akin to consternation in Germany if one may judge by the indignant criticisms, is, in short, the Allies' answer to the German petition.

The major concession made in the schedule is that the maximum speed at which aeroplanes may be flown when travelling at a height of 2,000 metres (6,560 ft.) is increased from 170 km./p.h. (105½ m.p.h.) to 180 km./p.h. (111¾ m.p.h.). The maximum altitude is still restricted by the rule under which machines must not be built capable of attaining a greater height than 4,000 metres (13,100 ft.). The weight, inclusive of pilots and instruments, which may be carried is increased from 600 kilogrammes (1,322 lbs.) to 900 kilogrammes (1,983 lbs.). Prohibition of the use or manufacture of single-seater machines of more than 60 h.p. continues in force. Berlin Press criticisms suggest that this restriction is to prevent German pilots from competing at international flying meetings. The cubic capacities up to which airships may be constructed in Germany also remains as hitherto, *i.e.*, 30,000 cubic metres for rigid airships, 25,000 cubic metres for semi-rigids, and 20,000 cubic metres for those of non-rigid structure. Every device which facilitates the conversion of commercial 'planes to military uses is also prohibited. This restriction is not very clearly defined, and owing to the loose terms employed, suggests extraordinary elasticity which is considered obnoxious by the Germans, who infer that the Air Guarantee Committee may call in this clause to restrict almost anything.

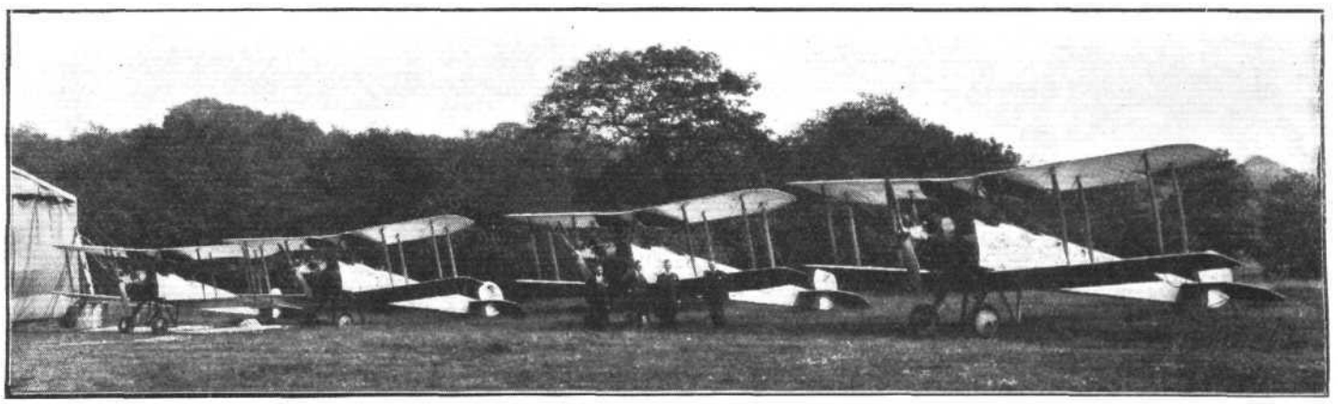
The new Rule 8 empowers the Air Guarantee Committee to demand lists of German aircraft factories, and inventories of aircraft material imported, exported, or in transit over German territory. Previously the Air Guarantee Committee could only ask for particulars of complete aeroplanes, but, as will be seen, the new Rule allows of much closer scrutiny, and on this account is condemned in Berlin as "legalised espionage." Before undertaking the manufacture of aeroplane engines, permission must be received from the Committee.

Under Rule 9, the Air Guarantee Committee are authorised to define the "ordinary requirements of commercial aviation in Germany," and the number of aeroplane engines, the quantity of stores and accessories, and also the number of pupils or apprentice mechanics, must all be limited so as to be compatible only with the definition of the Committee regarding "commercial requirements." This measure is criticised on the grounds that it places an extensive veto on new commercial developments.

The Press generally attack the latest schedule of restrictions in indignant terms, and describe the imposition of these measures as being "the latest effort at strangulation." It is anticipated that the German Air Advisory Board will convene a meeting at an early date, and following the technical exposition of what the restrictions in effect will mean to aviation in that country, and with the considered advice of experts before them, the German Cabinet will give much anxious attention to the whole subject preparatory to issuing a draft reply.

With regard to the restrictions on altitude, it is complained that this will debar German air lines from extending their routes to link up with existing passenger routes over the summit of the Alps, and, on this score, comes in for strenuous opposition. The activities of flying schools and students' flying clubs, and also the practice at some aircraft factories of training mechanics to be pilots, may also be proscribed by the Committee in virture of its new powers.

◈ ◈ ◈ ◈



AVROS FOR GREECE: Our photograph shows four of a batch of "Avro-Lynx" biplanes built for Greece. With its Oleo undercarriage and reliable Siddeley "Lynx" engine, the Avro 504 N. is a remarkably successful training machine. Standing in front of the second machine from the right are representatives of the Greek Government.

AERONAUTICS AT WEMBLEY

ON Thursday last the Air Ministry organised a special visit to the aeronautical sections of the British Empire Exhibition at Wembley. Following the inspection—which lasted about two and a half hours—a lunch took place in the Garden Club, at which Sir Philip Sassoon, Under-Secretary of State for Air, and Sir Sefton Brancker, Director of Civil Aviation, delivered short addresses on the importance of interesting and educating the general public in matters aeronautic, and as to how the Air Ministry were endeavouring to do their bit in this connection by means of the air exhibits at Wembley. We have previously made brief reference in FLIGHT to the air exhibits at Wembley, but on Thursday we had our first opportunity of making a thorough inspection of these in their completed form. It must be admitted at the outset that we were agreeably surprised at the thoroughness with which the important subject of aeronautics has been treated—for rumour had it that aircraft had been somewhat left out in the cold at Wembley this year.

The aeronautical exhibit has been divided into three main sections—two in the Government Pavilion, dealing with the Royal Air Force side and the civil side respectively, and a third section in the Palace of Transport and Housing, which is devoted to the transport side of aviation. Starting at the Government Pavilion, we first inspected the section dealing with aerial survey and photography. This branch of aviation is, as we have frequently stated in FLIGHT one of considerable importance, and the various exhibits at Wembley demonstrate this in an excellent manner. Numerous examples of photographs are shown illustrating the methods employed in aerial map-making, surveying, etc., as well as specimens of the various instruments employed. One very interesting exhibit consists of a large map of Canada showing vast tracts of uncharted areas, and another map of the same area which was recently completed by means of aerial survey. Whereas in the former map little else but blank spaces were to be seen, in the latter map every bit of space is filled in to the minutest detail. Some of the mosaics are extremely interesting, especially that relating to the Irrawaddy delta, completed a year or so ago. Another wonderful exhibit in connection with aerial survey work is the Camera Plastica.

This instrument consists of two projectors throwing the images of a stereoscopic pair of vertical photographs on the same area of a horizontal screen, *i.e.*, the two vertical views are superimposed. We are afraid we are unable at the moment to describe in detail the operation of this instrument, but, briefly stated, it may be explained that the image indicates points which are at different levels by the amount of overlap of each picture at that particular point. The horizontal screen may be raised or lowered—which movement corresponds to a scale of altitude in relation to the image—by the operator, thus enabling a plan to be drawn and the approximate elevations of various points to be determined. We could have remained in this section for hours, but we had to push along as there was still a lot to be seen. We next inspected a beautifully made model of an air-port of the future, in which the general lay-out was realistically and artistically shown, and a similar model of an airship port. There were also excellent models of the various types of air liners, suspended in mid-air in beautiful and natural "settings." Airship transport was illustrated by a model showing embarking, or vice versa, by means of the mooring mast; whilst a second model showed a section of the proposed Burney airship, exposing to view the very complete and elaborate arrangements of the cabins, etc. A special illuminated map indicated the air routes of the world.

Before leaving this section we spent a short time—far too short, but time was limited—looking over the extremely interesting historical exhibit that has been arranged by Mr. J. E. Hodgson. This consists of a picked selection of prints, manuscripts, books, relics and models, mostly from Mr. Hodgson's own valuable collection, relating to those very early and fascinating records of ballooning and not altogether successful attempts at mechanical flight. Having managed to tear ourselves away from here, we proceeded to the R.A.F. section, on the other side of the Government Pavilion, where the Service side of flying is presented in an excellent manner. As far as the general public is concerned, perhaps the most popular exhibit here consists of some forty scale models of aircraft, from the early Lininthal and Pilcher gliders to the latest types of commercial and military machines. Then there is a model of the R.A.F. station at Halton, where the R.A.F. aircraft apprentice is trained, beautifully set out, from which, together with accompanying explanations, an excellent idea of the day's life—and a happy one it appears to be, too—of an aircraft apprentice can easily be visualised. The significance of aerial warfare is emphasised by the display of a fearsome-looking bomb, 12 ft. high, carried by the large bombing planes and capable of doing considerable damage. In contrast, a baby incendiary bomb, 3 in. long, is shown alongside. For the more technical-minded there is a model wind channel from which the method of obtaining data relating to the characteristics of an aerofoil may be seen in operation.

An instructive exhibit—and a popular one too—consists of a full-size cockpit complete with instruments and controls, above which is a model aeroplane, the control surfaces of which are geared to move in sympathy with the full-size controls below. The latter are made to go through various movements necessary in the control of an aeroplane, and the model, following each movement, takes up the position in the air which it would if the surface had been moved in actual flight. There are many other interesting exhibits in this section, such as examples of metal and wood air screws, instruments, testing methods (arranged by the A.I.D.), etc. However, we are now due in the third section in the Palace of Housing and Transport, and so must proceed to describe what is to be seen there.

The exhibit in the Palace of Housing and Transport occupies a space of about 14,000 sq. ft., and is undoubtedly one of the popular attractions of the building.

This exhibit shows available types of aircraft used in the Royal Air Force, in Civil Air Transport services and various navigational and medical instruments of an interesting nature.

The Service exhibit consists of three aircraft—a De Havilland 9A, a Sopwith Snipe and a Bristol Fighter. The first two of these aircraft are of special interest to visitors as the D.H.9A, is a day-bombing aircraft for use as counter-offensive aircraft against enemy territories, and the Snipe is a defensive machine for use against enemy bombers. Both of these are Home Defence aircraft.

The third Service machine—a Bristol Fighter—was originally designed for fighting purposes, but is now used for co-operation with the Army—in particular for reconnaissance purposes with the cavalry, infantry and tanks, and for both reconnaissance and observation duties with the artillery. Communication with the land forces is maintained by radio telephony or wireless telegraphy. These machines also carry out photographic reconnaissances as required.

Before passing from the exhibit of fighting aircraft one must note the Martinsyde high-speed fighting aircraft which has been developed by the Aircraft Disposal Company from a machine which was largely used by the Royal Air Force during the Great War. The aircraft is loaned by the A.D.C., who also exhibit other "selections from their repertoire." An S.E.5A is also shown without the fabric covering, so that the method of construction may be seen.

On the civil aviation side two large passenger and freight aircraft have been loaned to the Air Ministry for purposes of exhibition by Imperial Airways, Ltd.; these are a Vickers Vulcan freighter and a Bristol ten-seater tourer, which are exhibited as illustrating civil types used on the Continental air routes. A Parnall "Pixie" light 'plane placed under the wings of the "Vulcan" presents an interesting contrast in aircraft design.

The most important of the navigational exhibits is a full-scale replica of the Control Tower at Croydon Aerodrome. The Control Tower is a model approximately true to scale of the original Tower at the Croydon Aerodrome, and contains a certain amount of apparatus similar to that used in the original. A "Loud-speaker" is installed which repeats the conversations carried on between the Control Officer at Croydon and aircraft flying to and from the various aerodromes in Western Europe; the conversations are relayed by special direct land line from the Croydon Wireless Control Station to the Control Tower at Wembley, so that the visitor to the exhibit can obtain a very accurate idea of the system of communication used in controlling the latest form of transport. To a certain extent this wireless telephony fulfils the part played on the railway by signalling devices. The progress made by the air liners during the day is marked out on a chart in the control tower.

A duplicate of the automatically-operated aerial lighthouse installed at Cranbrook in Kent on the Croydon-Continental route is also exhibited.

A medical exhibit which possesses novel qualities is the Reid time reaction apparatus for testing pilots, which is loaned by the Royal Aero Club. It enables "air doctors" to test on the ground with accuracy the potential abilities

of a pilot as the instrument is so constructed that the pilot is tested under conditions very similar to those obtained in actual flight. In this apparatus the pilot can bank, glide and go into a spin, and do other testing manœuvres required in flying an aeroplane. Inexorable tape-recording machines and chronometers register every single angle, which is at the same time registered by various coloured lights in front of the pilot, so that he may correct his mistakes until three white lights blink out, showing that he has regained the control of his machine. We hope to have something further to say on this device on a future occasion.

Two types of high-powered aircraft engines are shown in sectionalised form, a 450 h.p. Napier "Lion" and a 380 h.p. Bristol "Jupiter" radial.

Other engines shown are the A.D.C. 27/60 h.p. "Cirrus" engine, which is fitted in the De Havilland "Moth" light aeroplane, and the Siddeley "Puma," which was fitted to the D.H.50 machine, in which Sir W. Sefton Brancker, piloted by Mr. A. J. Cobham, flew to and from India. There is also exhibited the 120/140 h.p. Airdisco engine, which has been developed for training and light commercial machines.

Airships are represented by a port wing power car of a rigid airship of the R.36 class, fitted with a 375 h.p. Sunbeam "Cossack" engine. We would, perhaps, liked to have seen just a little more at Wembley relating to airships than we did—but no doubt, under the circumstances, this would not have been quite so easy a matter to accomplish as it might seem.

Other exhibits include an up-to-date map of European air routes, aerial photographs, etc.

In conclusion, we wish to congratulate all concerned on the very excellent Air Exhibit, of all combined sections, at Wembley, covering as it does practically every aspect of aeronautics.

THE ROYAL AIR FORCE

London Gazette, July 7, 1925.

General Duties Branch

Flight-Lieut. T. M. Williams, M.C., D.F.C., is granted permanent comm. in rank stated (July 8); Pilot Officer J. J. Nolan is promoted to rank of Flying Officer, with effect from March 15, and with seny. Sept. 15, 1924. The follw. Pilot Officers are promoted to rank of Flying Officer:—J. B. Townend (May 15); P. Slocombe, W. J. Pearson, M. M. Miln, C. G. C. Sullivan (June 10); A. E. Paish (June 12); D. J. F. McMillan (June 15). The follg. Flying Officers are granted the hon. rank of Flight Lieut.:—L. S. Hamilton (Capt. Indian Army, retd.) (June 4); W. F. Humphery (Lieut., R.N., retd.) (May 4) R. E. B. Rose (Lieut., R.N., retd.) (June 22).

Flight-Lieut. J. A. Barron is placed on half-pay, scale B, from July 7 to Sept. 15, inclusive; Pilot Officer A. H. Montgomery takes rank and precedence as if his appt. as Pilot Officer bore date May 19, reduction to take effect from May 25.

The follg. Flying Officers are transferred to the Reserve:—Class A: T. J. Shaw (July 5); D. R. Sharman, M.C. (July 7). Class C: C. A. Mason (May 9); E. K. Clifford (June 27).

Pilot Officer J. A. Bramley relinquishes his short-service commission on account of ill-health (July 8).

Reserve of Air Force Officers

Pilot Officer R. P. Whyte is confirmed in rank (July 6); Pilot Officer A. M. Mackay is confirmed in rank (June 16). (Substituted for *Gazette*, June 23, 1925). Pilot Officer F. H. Pidgeon is trans. from Class C. to Class A (June 10); Flying Officer H. A. Mason is trans. from Class A to Class C (July 7).

Memorandum

2nd-Lieut. E. J. W. Timson is deprived of his hon. commn. on conviction by the Civil Power (May 22).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Squadron Leader T. W. Elsdon, to Station H.Q., Donibristle. 15.7.25.

Flight Lieutenants: C. E. Barraclough, to No. 7 Sqdn., Bircham Newton. 13.7.25. N. Keeble, D.S.C., D.F.C., to R.A.F. Depot, on transfer to Home Estab. 23.6.25. F. W. Walker, D.S.C., A.F.C., to R.A.F. Base, Leuchars, on transfer to Home Estab. 2.7.25. P. W. S. Bulman, M.C., A.F.C., to remain at Experimental Section, R.A.E., S. Farnborough, instead of to No. 111 Sqdn., as previously notified. W. A. B. Savile, to R.A.F. Depot, on transfer to Home Establ. 18.6.25.

Flying Officers: A. R. Wardle, to Marine Aircraft Experimental Establ. (Flying-boat Development Flt.), Felixstowe. 9.7.25. J. T. Hall, to Station H.Q., Donibristle. 15.7.25. G. A. Hadley, to H.Q. Coastal Area. 13.7.25. F. G. Cator, to No. 207 Sqdn., Eastchurch. 7.7.25. H. M. Mellor, to No. 443, Flight, Leuchars. 11.7.25. Hon. Flight-Lieut. D. S. Cairnes, to Record Office, Ruislip. 17.7.25. R. B. Fleming, to Record Office, Ruislip. 6.8.25. L.E. Maynard, to R.A.F. Depot. 16.7.25. F. R. Lines, to R.A.F. Depot. 13.7.25. T. B. Fenwick, to R.A.F. Depot, on appointment to a Short-Service Commn. 9.7.25.

Pilot Officers: J. A. P. A. Yearsley, to No. 28 Sqdn., India; 1.6.25. G. A. Simons, to No. 31 Sqdn., India; 27.5.25. A. C. Watkins, to No. 2 Flying Training Sch., Digby, on transfer to Home Estabt.; 13.6.25.

Pilot Officers: H. R. F. Baxter, to R.A.F. Base, Calshot. 6.7.25. J. C. Don, to No. 99 Sqdn., Bircham Newton. 15.7.25. H. D. Gunton and B. E. Moody, to R.A.F. Depot, on transfer to Home Estab. 23.6.25.

Stores Branch

Flight Lieutenant W. A. Glasper, to No. 4 Stores Depot, Ruislip; 26.6.25.

Flying Officer A. J. Redman, D.F.C., to Station H.Q., Donibristle. 15.7.25.

Accountant Branch

Flight Lieutenant.—H. J. Gilbert, to R.A.F. Depot, on transfer to Home Estab.; 31.5.25. L. de L. Leder, to Inland Area Aircraft Depot, Henlow; 6.7.25.

Flying Officer B. G. Drake, to Station H.Q., Donibristle. 15.7.25.

Pilot Officer G. Goodall, to Aeroplane and Armament Experimental Estab., Martlesham Heath. 6.7.25.

Medical Branch

Flight Lieutenant P. A. Hall, M.B., B.A., to R.A.F. Hospital, Cranwell. 13.7.25.

Flight Lieutenants (Dental): P. P. Hogan and S. A. McCormack, to R.A.F. Depot, on appointment to Temp. Commns. 1.7.25. M. J. O'Reilly, to H.Q., Cranwell, on appointment to a Temp. Commn. 1.7.25.

IN PARLIAMENT

German Aviation Restrictions

CAPTAIN BENN, on July 6, asked the Secretary of State for Foreign Affairs whether he can give particulars of the correspondence that has passed between the Conference of Ambassadors and the German Government relative to the restriction of German aviation?

Mr. A. Chamberlain: In May, 1922, the German Government accepted the nine rules drawn up by the Allies for distinguishing between military aircraft which, by the terms of the Treaty of Versailles, Germany is forbidden to possess, and civil aircraft. On March 15, 1924, the German Government addressed a note to the Ambassadors' Conference pressing for the modification of these rules on the ground of the progress made in aviation since 1922. The Allied experts examined the matter very thoroughly, and, after hearing the arguments put forward verbally by the German experts in support of their case, unanimously recommended that certain modifications should be made. The new rules drafted by the Allied experts were approved by the Ambassadors' Conference, and notified to the German Government on June 24 last. The most important modifications are the increase of maximum speed at a height of 2,000 metres from 170 to 180 kilometres per hour, and the increase of useful load from 600 to 900 kilogrammes, inclusive of crew and instruments.

Airships

MR. VIANT asked the Secretary of State for Air what has been the total expenditure on airships since the suspension of flying operations in 1921; if the R.35, R.37, R.39, R.80, L.64, and L.71, then in existence, have been disposed of; and, if so, what money was received for them?

Sir Samuel Hoare: The answer to the first part of the question is £380,000, all but a negligible portion being expenditure on the new airship programme; to the second, that the contracts for the R.35 and R.39 were cancelled, that the R.37, L.64, and L.71 were scrapped, all useful gear being removed and kept for future use, and that the R.80 is being used for strain experiments; to the last part of the question, that none of the airships were sold, but some of the unwanted parts of those which were broken up realised about £1,300.

Mr. Viant asked what was the cost of the British airships R.39 and the R.80; by whom were these airships constructed; and what are the total hours of flight of each vessel?

Sir S. Hoare: As regards the first part of the question, the cost of the R.39, which was not completed, was approximately £90,000, and the cost of the R.80 £275,000. As regards the second part, the R.39 was constructed by Messrs. Armstrong, Whitworth and the R.80 by Messrs. Vickers. As regards the last part, no flights were performed by the R.39, and approximately 73 hours were flown by the R.80.

R.A.F. Personnel

SIR F. SYKES asked the Secretary of State for Air whether he can state, in respect of the years 1923-24 and 1924-25, and excluding the Royal Air Force in India, the average number of personnel employed, military and civilian; the average number of qualified pilots; the average number of pilots under training; the average number of qualified pilots of the rank of squadron leader or lower rank; the average number of machines employed in units; the machine hours flown; the number of machines written off charge; and the total expenditure (excluding civil aviation and capital charges other than replacement of material written off)?

Sir S. Hoare: The answer to the various parts of the question is as follows:—

(1) Average number of personnel:—

	R.A.F.	Civilians.
1923-24	28,121	17,300
1924-25	30,137	16,250

R.A.F. Pageants

MR. THURTLE, on July 8, asked the Secretary of State for Air what casualties, if any, occurred at the Royal Air Force Pageant last year and this year?

The Under-Secretary of State for Air (Major Sir Philip Sassoon): There were no casualties on either occasion.

Pay and Allowances

VICE-ADMIRAL SIR REGINALD HALL asked whether any modifications, in addition to the pay and/or allowances of officers, married or single, have been made since September, 1919?

Sir P. Sassoon: As regards pay, a reduction of 5½ per cent. took place upon July 1, 1924, in accordance with the conditions attached to the improved rates introduced in 1919 that they should be revised after five years in the light of the cost of living. On the other hand, command pay of 5s. a day has been granted to the wing commander of certain formations. As regards allowances, there have been periodical revisions of the rates of fuel, light and ration allowances, which are reviewed every quarter in accordance with the fluctuation in the cost of the issues in kind; and new rates of fuel and light allowance were introduced in October, 1920, when a differentiation was made between the allowances for married and single officers.

Sir R. Hall: May I ask whether the result of the modifications of the allowances is to increase the allowances in a general way?

Sir P. Sassoon: The effect of the change made in October, 1920, was broadly speaking, to improve the rates payable to both married and single officers, in two items, light and fuel, owing to the cost of these commodities, but these are more or less balanced by reductions in the pay of single officers in certain junior ranks.

INSTITUTE OF AERONAUTICAL ENGINEERS

AN extraordinary meeting of the members of the Inst.Ae.E. will be held on July 23, at 7 p.m. at the Engineers' Club, Coventry Street, W.2. Several important resolutions are down for consideration, of which the following is a brief résumé :—

That the objects and rules of the Institution be altered by striking out the following clause :—To amalgamate with any other society or institution having objects wholly or partly similar to the Institution. That the objects and rules of the Institution be further altered by striking out clauses 11 and 16A and substituting the following rules therefor :—**11.** There shall be an annual subscription graded and payable as under : By members with honours diploma, members and associate members, three guineas ; associates, two and a-half guineas ; students, ten shillings and sixpence ; overseas members with honours diploma, overseas members, overseas associate members and overseas associates, one and a-half guineas ; overseas students, ten shillings and sixpence. The annual subscription of overseas members, associates and students shall be retained by the Institution. Such members, associates and students shall, in addition, pay such further subscription to their local branch as the Committee of such branch may fix. The financial year of the Institution shall run from January 1 to December 31 in each year. All subscriptions shall be payable in advance. **16A.** The Institution shall be governed by a Council to be elected at the annual general meeting, consisting of one President, two Vice-Presidents, and not less than nine and not more than thirty members, associate members and associates. The number of associate members upon the Council shall not exceed one-third of the total membership of the Council, and the number of associates shall not exceed two.

Alterations to clauses 16 (*b*) and 18 (*a*). Additional clauses —18 (*c*) and 18 (*d*) be added to the rules.

Other business of the meeting will be to conduct a special election for members of the Council and to note the resignation of Mr. W. O. Manning and Mr. F. R. Simms from the Council : To consider the Chairman's speech concerning the Council's proposed scheme for carrying on the Institution.

R.A.F. RE-UNIONS AND FUNCTIONS

No. 20 Squadron Re-union Dinner

A DINNER has been arranged, and will take place on July 25 (7.30 p.m. for 8 p.m.) at Oddenino's Restaurant (Glasshouse Street), when it is hoped that all of No. 20 Squadron will make every effort to be present. Lieut. A. N. Jenks, who is visiting "Blighty," will be present. The cost will be 12*s.* 6*d.* per head (exclusive of wine), and those wishing to attend are requested to notify H. Leslie Satchell, 8, Vicarage Road, Rugby, by July 18.

Air Ministry's New Telephone No.

THE Air Ministry telephone number is now Holborn 3434, and *not* Regent 8000 as heretofore.

R.A.F. Memorial Fund

THE usual meeting of the Grants Sub-Committee of the above fund was held at Iddesleigh House, Caxton Street, on July 9. Lieut.-Commander H. E. Perrin was in the chair, and the other members of the committee present were : Mrs. L. M. K. Pratt-Barlow, O.B.E., and Mr. W. S. Field.

The committee had before them 15 cases, and made grants to the extent of £99.

The next meeting was fixed for July 23.

The Vickers "Vanguard" at R.A.F. Display

IN referring to the Vickers' "Vanguard" Civil Transport machine in our issue of July 2, on the occasion of the R.A.F. Display at Hendon, we stated that this machine was fitted with two Napier "Lions." As a matter of fact, this machine was fitted with two Rolls-Royce "Condors." It is the service Troop Carrier of similar type—to which we also referred at the time—that is fitted with Napier "Lions" and in the rush of getting our special report through our confusion of respective engine types slipped by unnoticed.

Titanine, 86·666 Per Cent.

IT may be of interest to note that out of the fifteen entries for the King's Cup Race just closed, no fewer than thirteen of the machines were treated with Titanine Doping Schemes—mainly the famous T.2.S.

R.A.F. Mediterranean Flight

WITH Wing-Commander W. L. Welsh in charge, a squadron of five Fairey seaplanes reached Naples on July 7 from Syracuse. Owing to lack of petrol four were forced to descend in the Bay of Salerno and the fifth off Sorrento, but the authorities at Naples, on learning of the situation, at once despatched the necessary supplies and the British pilots were thus enabled.

The Empire's Aerial Routes

SPEAKING at the luncheon of the Empire Parliamentary Association at the House of Commons on July 8, Mr. Amery, Secretary of State for the Colonies, who presided, in referring to the fact that the ancient and interesting colony of Newfoundland was, next to the Irish Free State, the nearest oversea Dominion to this country, made the following remarks in connection with aviation. Speaking of the comparative nearness of those Dominions, due to modern transport, he said this nearness would be immensely accentuated with the development of air communication and with the coming of the airship we would begin to realise that Ireland, on the one hand, and Newfoundland, on the other, were the natural bridgeheads across the Atlantic, uniting those portions of the British Commonwealth.

Afghan Flight Disappointment

CONSIDERABLE disappointment was caused a vast and curious concourse, including the Amir of Afghanistan, all the Court officials, and the Soviet Minister, who had assembled on the Bokhara frontier of Afghanistan to await the arrival of Soviet aeroplanes from Termez, but the machines—owing to the non-arrival of essential parts—were unable to start.

SIDE-WIND

THE annual sports of the S. Smith and Sons (M.A.) Athletic Club, of which Mr. A. Gordon Smith is the President, were a great success this year. This time they were held under the A.A.A. rules, at the club ground, Dollis Hill Lane, Neasden, on July 4. Some excellent competition work was seen, and it was very gratifying to observe the keenness and earnestness of practically every one of the competitors. The saying "those who work hard know how to play hard" was evident in every event that took place. The whole afternoon's entertainment had been well thought out by the Committee, there being several side shows, some excellent music by the Great Central and Metropolitan Silver Prize Band, while the directors were on the spot the whole of the time to see that all their employees thoroughly made the most of an excellent afternoon.

PUBLICATIONS RECEIVED.

The Motor Repair Manual for the Owner-Driver and Amateur Mechanic. 4th Edition. Temple Press, Ltd., Rosebery Avenue, E.C. Price, 2*s.* 6*d.* net.

Vickers News : Summer Number. July, 1925. Vickers, Ltd., Vickers House, Broadway, Westminster, S.W.1. Price 2*d.* post free, 3*d.*

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations : Cyl. = cylinder ; i.c. = internal combustion ; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

APPLIED FOR IN 1924

Published July 16, 1925

6,899. S. VALDES. Jet-propulsion apparatus for the driving of flying-machines, etc. (235,630.)

6,965. SPERRY GYROSCOPE CO. Automatic steering-device for dirigible craft. (214,215.)

8,022. DORNIER METALLBAUTEN GES. and C. DORNIER. Flying-machines. (214,230.)

8,721. AIRCRAFT DISPOSAL CO., LTD., and J. KENWORTHY. Radiators. (235,674.)

9,395. H. SMITH and MITSUBISHI NAINENKI KABUSHIKI KAISHA, LTD. Balanced control surfaces of aircraft. (235,680.)

FLIGHT

The Aircraft Engineer and Airships

36, GREAT QUEEN STREET, KINGSWAY, W.C. 2.
Telegraphic address : Truditur, Westcent, London.
Telephone : Gerrard 1828.

SUBSCRIPTION RATES

"FLIGHT" *will be forwarded, post free, at the following rates :—*

UNITED KINGDOM		ABROAD*	
	s. *d.*		*s.* *d.*
3 Months, Post Free..	7 7	3 Months, Post Free..	8 3
6 " " ..	15 2	6 " " ..	16 6
12 " " ..	30 4	12 " " ..	33 0

* *Foreign subscriptions must be remitted in British currency.*